

NECESSARY CONDITIONS AND REQUIREMENTS FOR THE IMPLEMENTATION OF SIMULATION COURSES IN HIGHER EDUCATION

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Article history:		Abstract:
Received:	8 ^h October 2022	The purpose of these studies is to show the most important advantages of
Accepted:	10 th November 2022	modeling technologies. The objectives of our article are to study and learn
Published:	20 th December 2022	without harming the patient, and with the help of simulation training methods
		to assess the achieved high level of professional training of each specialist.

Keywords: modeling technologies, simulation training methods

The XX century is considered the century of the technical revolution, mechanical engineering, machine tool construction, military industry, aviation, cosmonautics, endomedicine, radioactive, nuclear magnetic resonance appear, develop and reach great heights. Due to the complexity of controlling this technique, it was impossib le without practicing driving on special simulators. This situation required the crea tion of simulators for more comfortable trainers, in connection with which comp lex simulators were built in the aviation and aerospace fields. Pilots and cosmona uts first trained hundreds of times on simulators, and if necessary thousands, after adaptation took place and then performed, as a result, good results were achieved.

The adoption of declarations of human rights and the emergence of paid services in medicine led to the emergence of opposition to the participation of students in the examination of patients in medicine. Thus, the examination of patients showed that simulators are in demand for teaching them to provide assistance and first aid cor rectly, completely and, if necessary, at the level of automatism. A wide path is open to the widespread use of simulators, simulators in the training of the future, even if it is expensive.

One of the signs of the last decade in Uzbekistan has been the rapid introduction of many virtual technologies into various spheres of human activity. In the local healt hcare system, among other things, various phantoms, models, mannequins, simula tors, virtual simulators and other technical training tools have appeared and have been widely introduced simulators of medical manipulations representing the pro cesses of professional activity of medical personnel, situations and other aspects to be studied are modeled with a certain degree of reliability. At the same time, if indi vidual phantoms have long been used in some educational institutions to develop the simplest practical skills, then the introduction of complex virtual simulators and control systems (virtual simulators) for their use in education appeared only in the last decade [2,5, 12,15,16].

According to the study of this system of neighboring countries, sufficient experien ce has been accumulated the use of simulation methods in education, including medicine. These technologies made it possible to create a simulation training system based on foreign experience. Its use is designed to significantly improve the quality, efficiency and safety of medical care provided to the population [3,10,13,14].

The purpose of these studies is to show the most important advantages of modeling technologies. The objectives of our article are to study and learn without harming the patient, and with the help of simulation training methods to assess the achieved high level of professional training of each specialist.

The system of training of medical specialists operating in Uzbekistan contributes to improving the provision of medical care, but does not ensure the identification of poorly trained and ineffective doctors and paramedical personnel, since these meas ures cover all areas of specialist competence and are not aimed at direct assess ment, but only assesses the level of mastery of practice by a medical professional. To solve this problem, the introduction of methods for monitoring the level of trai ning through a simulation training system will help.

At the same time, such a supervision process should be aimed at promoting profess sional development, identifying limitations in the provision of medical care and reducing the risk of adverse effects on the patient by a poorly trained doctor or medical professional. We believe that the main task of the simulation training sys tem should be the task of training good specialists for medicine [7, 9, 11].

This is indicated in the current laws and standards governing the production of medical devices. It is necessary to inform the patient and inform the patient that he has the right to refuse to participate in the provision of medical care. Patient con sent can be useful in providing medical care to students and young people. Pretake additional certification steps to model



each student and youth program, start the process of providing them with professional support, [4, 5, 8]. Currently, various phantoms, mockups, dummies, simulators, virtual simulators and other technical equipment representing the processes of professional activity of medical personnel, situations and other aspects to be studied, which are modeled with a certain degree of reliability, have been introduced and widely introduced into the local health care system, among other things. At the same time, if indivi dual phantoms have been used in some educational institutions for a long time to practice the simplest practical skills, then the introduction of complex virtual simu lators and a control system for their use in education has appeared only in the last twenty years. To date, sufficient experience has been accumulated in the use of simulation methods in education, including medical education[10].

Practical work requires a long time to master a practical view of performing vari ous medical interventions. So, according to the authors, in endovideosurgery, in order to obtain a specialized result, it is necessary to perform these exercises from 10 to 200 times and includes traditional methods of studying practical aspects of disease treatment: on animals, corpses, with the participation of patients (assistance in curation and support in treatment). These teaching methods are considered methods of training a bachelor's or specialist's student to certain practical skills. All these training options have disadvantages - when training animals, you need to pay for the vivarium and its maintenance, buy animals; at the same time, it is very difficult to control the requirements due to animal protection concerns, ethical problems with constant individual control of the educator for training on corpses. To achieve the appropriate level of practical skills, it is necessary to perform practical skills 100-200 times under the supervision of a teacher. These training opportunities require expensive equipment, tool kits and consumables [12,14]. The only effective and safe way to practice practical skills at the moment is simulation training provided by virtual technologies. Computergenerated situations actively react to the actions of the students and completely simulate the physiological reaction of the patient to the actions of the doctor or reproduce an adequate tissue response to the manipulation of the surgeon. Practical doctors who have acquired practical skills with the help of virtual simulators will go faster and more confidently to perform these interventions, and their subsequent real results will be more highly qualified. In addition, computer modeling based on objective data of a real

patient (MRI, CT, ultrasound, etc.) makes it possible to predict and even work out a future study or operation, which reduces the potential risk and improves the quality of medical care [1, 2, 14].

Today, dozens of companies around the world produce virtual trainers for medical professionals. Virtual simulators have undeniable advantages over the above trai ning options - there is no loss of learning energy and experience, and the time mode is not limited. The training takes place automatically, in one step and object tively, the quality of manipulation performance increases with repeated execution of these procedures on simulators. Automatic execution of procedures according to methodological recommendations and the connection of the program itself for the correct evaluation of the procedure for obtaining certificates. The realism of simu lation equipment used for training medical personnel is divided into seven levels [5,9,12, 16]. When developing simulators, the simulator automatically directs the program to the correct actions and shows the mistakes made, an objective certify cation is carried out. The first studies conducted by N. Seymour [10], T. Gran charov [6,10,15] show the advantages of virtual trackers. According to the authors, the use of a virtual simulator in the educational process reduces by 2.5 times the number of mistakes made by trainee surgeons during the first laparoscopic opera tions.

The results of the study confirm the legitimacy of the introduction of simulation virtual technologies in medical education and training programs. Each subsequent level of simulation virtual technologies in the program becomes more difficult to implement. According to these levels of realism, all simulators can be classified:

- 1. For clarity, traditional teaching technologies are used - diagrams, printed posters, models of human anatomical structure. In addition, it can be the simplest e-books and computer programs. The basis of any practical skill is visual simulation training, during which the correct sequence of actions is developed when performing medical manipulations. The disadvantage is the lack of practical training of the student.
- Passive phantom response reacting when repeated. At the same time, manual skills, coordinated actions and their sequence are developed. Thanks to real imagination, you can bring individual manipulations to the level of automatism, acquire technical skills to perform them.



3. 3. The answer when repeating the simplest active reactions of the phantom to the actions of the student is reactive. Assessment of the correctness of students' actions is carried out only at the basic level. Such dummies and simulators are made of plastic, filled with electronic controllers, the movements of the trainee are controlled electronically.

4. 4. Automated is the mannequin's reaction to external influences. Such simulators use computer technologies based on scenarios where certain actions are clearly answered by a phantom developed by cognitive minds



5. Equipment-medical office, operating environment. Thanks to such training systems, a reliable ability to act in such a reality is achieved.



6. Interactive - complex interaction of the simulation dummy with medical equipment and the trainee. Automatic changes in the physiological state of the artificial patient, an adequate response to medication and an immediate response to incorrect actions. At this level, the competence of the listener can be directly assessed.





7. Interaction of integrated simulators and medical devices. During practice, virtual simulators show all the necessary indicators.

CONCLUSIONS AND SUMMARY:

Simulation training in medical education is a modern training and evaluation technology based on realistic modeling of practical skills, modeling of a clinical situation – for this purpose, training models of varying complexity and realism are used.

The impact of simulation learning on skill retention was determined by Bonrath in 2010 (6 acquired skills: accuracy, speed):

1. When re-certifying skills after 6 weeks: 8 out of 9 skills are saved.

2. Re-certification after 11 weeks: 4 out of 9 skills are saved.

SUMMARY:

- 1. Simulation training in medicine is a detonator of knowledge on the automatic implementation of practical skills.
- Continuous acquisition and preservation of skills in medicine requires a long duration of work with simulation and frequent updating of skills.

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